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\*\*\* It is now 8/11/08 12:29:10 PM \*\*\*

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- Derwent World Patents Index (File 351)
- Derwent World Patents Index (File 350)
- Ei EnCompassPat (File 353)
- European Patents Fulltext (File 348)
- French Patents (File 371)
- German Patents Fulltext (File 324)
- IMS Patent Focus (File 447, 947)
- INPADOC/Family and Legal Status (File 345)
- JAPIO - Patent Abstracts of Japan (File 347)
- LitAlert (File 670)
- U.S. Patents Fulltext (1971-1975) (File 652)

- U.S. Patents Fulltext (1976-present) (File 654)
- WIPO/PCT Patents Fulltext (File 349)
- TRADEMARKSCAN - U.S. Federal (File 226)

#### DialogLink 5 Release Notes

New features available in the latest release of DialogLink 5 (August 2006)

- Ability to resize images for easier incorporation into DialogLink Reports
- New settings allow users to be prompted to save Dialog search sessions in the format of their choice (Microsoft Word, RTF, PDF, HTML, or TEXT)
- Ability to set up Dialog Alerts by Chemical Structures and the addition of Index Chemicus as a structure searchable database
- Support for connections to STN Germany and STN Japan services

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\*\*\* ANNOUNCEMENTS \*\*\*

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"Thomson File Histories" are now available directly through Dialog in selected patent and trademark files. Combined with the comprehensive patent and trademark information on Dialog, file histories give you the most complete view of a patent or trademark and its history in one place. When searching in one of the patent and trademark databases, a link to an online order form is displayed in your search results, saving you time in obtaining the file histories you need. See HELP FILEHIST for more information about how to use the link and a list of files that contain the link.

\*\*\*The 2008 Emtree Thesaurus has been added to EMBASE (Files 72, 73, 772, and 972)\*\*\*

RESUMED UPDATING

\*\*\*File 120, U.S. Copyrights

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RELOADS COMPLETED

\*\*\*File 50, CAB Abstracts

\*\*\*File 162, Global Health

\*\*\*File 342, Patents Citation Index

\*\*\*File 227, TRADEMARKSCAN(R) - Community Trademarks

\*\*\*

FILES RENAMED

\*\*\*FILE 321, PLASPEC now known as Plastic Properties Database

\*\*\*

FILES REMOVED

\*\*\*Files 476/Financial Times & 473/Financial Times Abstracts

\*\*\*Files 359,959,804, Chemical Economics Handbook

\*\*\*Files 360,960, Specialty Chemicals Update Program

\*\*\*

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? Help Off Line

\* \* \*

Connecting to Suzanne Noakes - Dialog - 276629

Connected to Dialog via SMS003341137

? b 155 biosci medicine 399

>>>W: 44 is unauthorized

76 is unauthorized

138 is unauthorized

3 of the specified files are not available

[File 155] MEDLINE(R) 1950-2008/Aug 08

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[File 5] Biosis Previews(R) 1926-2008/Aug W1  
(c) 2008 The Thomson Corporation. All rights reserved.

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[File 28] Oceanic Abstracts 1966-2008/Sep  
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[File 34] SciSearch(R) Cited Ref Sci 1990-2008/Aug W1  
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[File 35] Dissertation Abs Online 1861-2008/Apr  
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[File 40] Enviroline(R) 1975-2008/Apr  
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[File 45] EMCare 2008/Jul W4  
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[File 71] ELSEVIER BIOBASE 1994-2008/Jul W2  
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[File 73] EMBASE 1974-2008/Aug 07  
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[File 91] MANTIS(TM) 1880-2008/Aug  
2001 (c) Action Potential. All rights reserved.

[File 98] General Sci Abs 1984-2008/Jul  
(c) 2008 The HW Wilson Co. All rights reserved.

[File 110] WasteInfo 1974-2002/Jul  
(c) 2002 AEA Techn Env. All rights reserved.  
*\*File 110: This file is closed (no updates)*

[File 135] NewsRx Weekly Reports 1995-2008/Aug W1  
(c) 2008 NewsRx. All rights reserved.

[File 136] BioEngineering Abstracts 1966-2007/Jan  
(c) 2007 CSA. All rights reserved.  
*\*File 136: This file is closed.*

[File 143] Biol. & Agric. Index 1983-2008/Jul  
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[File 164] Allied & Complementary Medicine 1984-2008/Aug  
(c) 2008 BLHCIS. All rights reserved.

[File 172] EMBASE Alert 2008/Aug 08  
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*\*File 185: The file has been reloaded to add archive records back to 1864. Accession numbers have changed.*

[File 357] Derwent Biotech Res. \_1982-2008/Jul W2  
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[File 369] New Scientist 1994-2008/Jun W5  
(c) 2008 Reed Business Information Ltd. All rights reserved.

[File 370] Science 1996-1999/Jul W3  
(c) 1999 AAAS. All rights reserved.  
*\*File 370: This file is closed (no updates). Use File 47 for more current information.*

[File 391] Beilstein Database - Reactions 2007/Q4  
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[File 434] SciSearch(R) Cited Ref Sci 1974-1989/Dec  
(c) 2006 The Thomson Corp. All rights reserved.

[File 467] ExtraMED(tm) 2000/Dec  
(c) 2001 Informania Ltd. All rights reserved.

[File 149] TGG Health&Wellness DB(SM) 1976-2008/Jul W3  
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[File 156] ToxFile 1965-2008/Aug W1  
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[File 162] Global Health 1983-2008/Aug W1  
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[File 399] CA SEARCH(R) 1967-2008/UD=14906  
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[File 444] New England Journal of Med. 1985-2008/May W1  
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```

? s (copolymer or co-polymer) (n60) (hydrophilic) (n60) (hydrophobic)
    469252  COPOLYMER
    1064    CO-POLYMER
    193851  HYDROPHILIC
    457898  HYDROPHOBIC
S1      3171  S (COPOLYMER OR CO-POLYMER) (N60) (HYDROPHILIC) (N60) (HYDROPHOBIC)

? s ((protein copolymer) or (protein co-polymer)) (n60) (hydrophilic) (n60) (hydrophobic)
    0      PROTEIN COPOLYMER
    0      PROTEIN CO-POLYMER
    193851  HYDROPHILIC
    457898  HYDROPHOBIC
S2      0      S ((PROTEIN COPOLYMER) OR (PROTEIN CO-
POLYMER)) (N60) (HYDROPHILIC) (N60) (HYDROPHOBIC)

?
? s s1 and protein
Processing
Processing
    3171    S1
    13028717  PROTEIN
S3      425    S S1 AND PROTEIN

? s s3 and (ELP or elastin)
    425     S3
    2318    ELP
    46911    ELASTIN
S4      23     S S3 AND (ELP OR ELASTIN)

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? rd

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>>>W: Duplicate detection is not supported for File 391.

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Records from unsupported files will be retained in the RD set.

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? t s5/medium/all

5/3/1 (Item 1 from file: 155)

Fulltext available through: [STIC Full Text Retrieval Options](#)

MEDLINE(R)

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17500491 PMID: 17238231

Thermoresponsive self-assembly of short elastin-like polypentapeptides and their poly(ethylene glycol) derivatives.

Pechar Michal; Brus Jiri; Kostka Libor; Konak Cestmir; Urbanova Martina; Slouf Miroslav

Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, 162 06 Prague 6, Czech Republic.

pechar@imc.cas.cz

Macromolecular bioscience ( Germany ) Jan 5 2007 , 7 (1) p56-69 , ISSN: 1616-5187--Print Journal Code: 101135941

Publishing Model Print

Document type: Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

5/3/2 (Item 2 from file: 155)

Fulltext available through: [STIC Full Text Retrieval Options](#)

MEDLINE(R)

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17231075 PMID: 16953644

Micelle density regulated by a reversible switch of protein secondary structure.

Sallach Rory E; Wei Min; Biswas Nilanjana; Conticello Vincent P; Lecommandoux Sebastien; Dluhy Richard A;

Chaikof Elliot L

Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA.

Journal of the American Chemical Society ( United States ) Sep 13 2006 , 128 (36) p12014-9 , ISSN: 0002-7863--Print Journal Code: 7503056

Contract/Grant No.: EB001956; EB; United States NIBIB; HL60464; HL; United States NHLBI; HL71336; HL; United States NHLBI

Publishing Model Print

Document type: Journal Article; Research Support, N.I.H., Extramural

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

5/3/3 (Item 1 from file: 34)

Fulltext available through: [STIC Full Text Retrieval Options](#)

SciSearch(R) Cited Ref Sci

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17325729 Genuine Article#: 251ZW No. References: 67

In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

Author: Lim DW; Nettles DL; Setton LA; Chilkoti A (REPRINT)

Corporate Source: Duke Univ, Dept Biomed Engr, Box 90281/Durham/NC/27708 (REPRINT); Duke Univ, Dept Biomed Engr, Durham/NC/27708

Journal: BIOMACROMOLECULES, 2008, V 9, N1 (JAN), P 222-230

ISSN: 1525-7797 Publication date: 20080100

Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA

Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

5/3/4 (Item 1 from file: 35)

Dissertation Abs Online

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01741167 ORDER NO: AADAA-I9968377

Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

Author: Lee, Terrence Anita-Talley

Degree: Ph.D.

Year: 2000

Corporate Source/Institution: Emory University (0665)

Source: Volume 6104B of Dissertations Abstracts International.

PAGE 1973 . 106 PAGES

5/3/5 (Item 1 from file: 71)

Fulltext available through: [STIC Full Text Retrieval Options](#)

ELSEVIER BIOBASE

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03988946 2008038926

In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

Lim D.W.; Nettles D.L.; Setton L.A.; Chilkoti A.

Address: A. Chilkoti, Department of Biomedical Engineering, Duke University, Box 90281, Durham, NC 27708-0281, United States

Email: [chilkoti@duke.edu](mailto:chilkoti@duke.edu)

Journal : Biomacromolecules, 9/1 (222-230), 2008, United States

CODEN: BOMAF

ISSN: 1525-7797

Document Type: Article

Languages: English Summary Languages: English



No. of References: 67

CLASSIFICATION CODE AND DESCRIPTION:

Molecular Sequence Databank Number: 82.12.4.2 - PROTEIN BIOCHEMISTRY / OTHER PROTEINS /  
Structural Proteins / Elastin

5/3/6 (Item 1 from file: 135)

NewsRx Weekly Reports

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0000647990 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Recent findings from Georgia Institute of Technology, U.S., highlighted

Biotech Business Week, October 8, 2007, p.2387

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English

RECORD TYPE: FULLTEXT

Word Count:

1047

5/3/7 (Item 2 from file: 135)

NewsRx Weekly Reports

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0000597426 (USE FORMAT 7 OR 9 FOR FULLTEXT)

New research results reported by researchers with Georgia Institute of  
Technology, U.S.

Biotech Business Week, August 20, 2007, p.2565

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English

RECORD TYPE: FULLTEXT

Word Count:

938

5/3/8 (Item 3 from file: 135)  
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0000575859 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Results of recent studies reported by Georgia Institute of Technology, U.S.

Life Science Weekly, July 31, 2007, p.5727

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
1299

5/3/9 (Item 4 from file: 135)  
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0000551447 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Study findings from Georgia Institute of Technology, U.S., are outlined in reports

Science Letter, June 26, 2007, p.4081

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
820

5/3/10 (Item 5 from file: 135)  
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0000531151 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., researchers publish most recent findings

Biotech Business Week, May 28, 2007, p.1693

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
1417

5/3/11 (Item 6 from file: 135)  
NewsRx Weekly Reports  
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0000514629 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Research from Georgia Institute of Technology, U.S., provides new insights into human health

Pharma Business Week, May 7, 2007, p.2453

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
1452

5/3/12 (Item 7 from file: 135)

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0000503440 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Study data released by Georgia Institute of Technology, U.S.

Biotech Business Week, April 23, 2007, p.1821

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
1373

5/3/13 (Item 8 from file: 135)  
NewsRx Weekly Reports  
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0000479681 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., researchers summarize new study results

Biotech Business Week, March 26, 2007, p.1226

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
1609

5/3/14 (Item 9 from file: 135)  
NewsRx Weekly Reports  
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0000440121 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., investigators have published new study data

Biotech Business Week, February 12, 2007, p.1430

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
833

5/3/15 (Item 10 from file: 135)  
NewsRx Weekly Reports  
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0000428537 (USE FORMAT 7 OR 9 FOR FULLTEXT)

New biomedical engineering study findings recently were published by researchers at Georgia Institute of Technology, Department of Biomedical Engineering

Obesity, Fitness & Wellness Week, February 10, 2007, p.511

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English  
RECORD TYPE: FULLTEXT

Word Count:  
343

5/3/16 (Item 11 from file: 135)  
NewsRx Weekly Reports  
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0000356587 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Micelle density is regulated by reversible protein secondary

structure

Gene Therapy Weekly, November 9, 2006, p.105

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English

RECORD TYPE: FULLTEXT

Word Count:

332

? TYPE 1741167/full from 35

1741167/9 (Direct type from file: 35)

Dissertation Abs Online

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01741167 ORDER NO: AADAA-I9968377

Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

Author: Lee, Terrence Anita-Talley

Degree: Ph.D.

Year: 2000

Corporate Source/Institution: Emory University ( 0665 )

Adviser: Vincent P. Conticello

Source: Volume 6104B of Dissertations Abstracts International.

PAGE 1973 . 106 PAGES

Descriptors: CHEMISTRY, POLYMER ; ENGINEERING, MATERIALS SCIENCE ; BIOLOGY, MOLECULAR

Descriptor Codes: 0495; 0794; 0307

The overall goal in material science is to be able to control the molecular architecture of a material and thus its end properties. There is no method that offers greater control than the biological synthesis of proteins. From the DNA sequence to the final synthesized protein, the entire process is finitely controlled. This present work describes methods developed and used to synthesize protein polymers by manipulating this process. From the initial DNA sequence chosen, the end properties that the protein polymer will have are dictated. An amphiphilic diblock copolymer was designed based on environmentally responsive elastin-mimetic peptide sequences ((Val/Ile)-Pro-Gly-Xaa-Gly) (Xaa = Ala or Glu for the hydrophilic block, Val or Phe for the hydrophobic block) and synthesized using a genetic engineering approach. Differential scanning calorimetry measurements in aqueous solution revealed that reversible hydrophobic folding and assembly of the copolymer occurs above the inverse temperature transition, *T<sub>i</sub>*, of the hydrophobic block. This process results in the formation of 50 nm protein-based micellar aggregates, which were characterized by electron microscopy and temperature-dependent dynamic light scattering techniques. The distribution of micellar aggregates can be altered reproducibly through variation of environmental conditions including pH and temperature. The uniform and defined macromolecular architecture of this protein copolymer permits greater control over the physical properties of the micelles, which therefore may

facilitate applications in controlled release of small molecules.

? d s

Set	Items	Description
S1	3171	S (COPOLYMER OR CO-POLYMER) (N60) (HYDROPHILIC) (N60) (HYDROPHOBIC)
S2	0	S ((PROTEIN COPOLYMER) OR (PROTEIN CO-POLYMER)) (N60) (HYDROPHILIC) (N60) (HYDROPHOBIC)
S3	425	S S1 AND PROTEIN
S4	23	S S3 AND (ELP OR ELASTIN)
S5	16	RD (unique items)

? t s5/full/1-5

5/9/1 (Item 1 from file: 155)

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MEDLINE(R)

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17500491 PMID: 17238231

Thermoresponsive self-assembly of short elastin-like polypentapeptides and their poly(ethylene glycol) derivatives.

Pechar Michal; Brus Jiri; Kostka Libor; Konak Cestmir; Urbanova Martina; Slouf Miroslav

Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, 162 06 Prague 6, Czech Republic.

pechar@imc.cas.cz

Macromolecular bioscience ( Germany ) Jan 5 2007 , 7 (1) p56-69 , ISSN: 1616-5187--Print Journal Code:

101135941

Publishing Model Print

Document type: Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Short polypeptides with four pentad repeats, (VPGVG)(4) and (VPAVG)(4), were synthesised by manual fluorenylmethoxycarbonyl/tert-butyl (Fmoc/t-Bu) solid phase peptide synthesis using a convergent approach. In the next step, the peptides were coupled via their N-terminus with activated semi-telechelic poly(ethylene glycol) O-(N-Fmoc-2-aminoethyl)-O'-(2-carboxyethyl)undeca(ethylene glycol) (Fmoc-PEG-COOH) to yield monodisperse Fmoc-PEG-peptide diblock copolymer. Both the presence of the terminal hydrophobic Fmoc group and the hydrophilic PEG chain in the copolymers were shown to play a crucial role in their self-associative behaviour, leading to reversible formation of supramolecular thermoresponsive assemblies. The peptides and their PEG derivatives were characterised by HPLC, NMR and MALDI-TOF MS. The associative behaviour of the peptides and their PEG derivatives was studied by dynamic light scattering, MAS NMR and phase contrast microscopy. [image: see text]

Descriptors: \*Elastin--chemistry--CH; \*Peptides--chemistry--CH; \*Polyethylene Glycols--chemistry--CH; Amino

Acid Sequence; Chromatography, High Pressure Liquid; Magnetic Resonance Spectroscopy; Microscopy, Phase-Contrast; Models, Molecular; Oligopeptides--chemical synthesis--CS; Oligopeptides--chemistry--CH; Protein Conformation; Scattering, Radiation; Spectrometry, Mass, Matrix-Assisted Laser Desorption-Ionization; Thermodynamics

CAS Registry No.: 0 (Oligopeptides); 0 (Peptides); 0 (Polyethylene Glycols); 9007-58-3 (Elastin)

Record Date Created: 20070129

Record Date Completed: 20070403

5/9/2 (Item 2 from file: 155)

Fulltext available through: [STIC Full Text Retrieval Options](#)

MEDLINE(R)

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17231075 PMID: 16953644

Micelle density regulated by a reversible switch of protein secondary structure.

Sallach Rory E; Wei Min; Biswas Nilanjana; Conticello Vincent P; Lecommandoux Sebastien; Dluhy Richard A; Chaikof Elliot L

Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA.

Journal of the American Chemical Society ( United States ) Sep 13 2006 , 128 (36) p12014-9 , ISSN: 0002-7863-

-Print Journal Code: 7503056

Contract/Grant No.: EB001956; EB; United States NIBIB; HL60464; HL; United States NHLBI; HL71336; HL; United States NHLBI

Publishing Model Print

Document type: Journal Article; Research Support, N.I.H., Extramural

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Protein secondary structures may exhibit reversible transitions that occur in an abrupt and controllable manner. In this report, we demonstrate that such transitions may be utilized in the design of a "smart" protein micellar system, in which a stimulus-induced change in protein structure triggers a rapid change in micelle compacticity and size. Specifically, recombinant DNA methods were used to prepare a protein triblock copolymer containing a central hydrophilic block and two hydrophobic end blocks derived from elastin-mimetic peptide sequences. Below the copolymer inverse transition temperature ( $T(t)$ ), dilute solutions of this amphiphilic protein formed monodispersed micelles in a narrow range of  $R(H)$  of approximately 100 nm. When the temperature was raised above  $T(t)$ , an abrupt increase in micelle internal density was observed with a concomitant reduction in micelle size. This reversible change in micelle compacticity was triggered by helix-to-sheet protein folding transition. Significantly, these protein polymer-based micelles, which are rapidly responsive to environmental stimuli, establish a new mechanism for the design of controlled drug delivery vehicles.

Descriptors: \*Elastin--chemistry--CH; \*Peptides--chemistry--CH ; Amino Acid Sequence; Biomimetic Materials--chemistry--CH; Circular Dichroism; Light; Micelles; Molecular Sequence Data; Protein Structure, Secondary; Recombinant Proteins--chemistry--CH; Scattering, Radiation

CAS Registry No.: 0 (Micelles); 0 (Peptides); 0 (Recombinant Proteins); 9007-58-3 (Elastin)

Record Date Created: 20060906



Record Date Completed: 20070815

5/9/3 (Item 1 from file: 34)

Fulltext available through: [STIC Full Text Retrieval Options](#)

SciSearch(R) Cited Ref Sci

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17325729 Genuine Article#: 251ZW Number of References: 67

In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

Author: Lim DW; Nettles DL; Setton LA; Chilkoti A (REPRINT)

Corporate Source: Duke Univ, Dept Biomed Engr, Box 90281/Durham/NC/27708 (REPRINT); Duke Univ, Dept Biomed Engr, Durham/NC/27708

Journal: BIOMACROMOLECULES, 2008, V 9, N1 (JAN), P 222-230

ISSN: 1525-7797 Publication date: 20080100

Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA

Language: English Document Type: ARTICLE

Geographic Location: USA

Journal Subject Category: BIOCHEMISTRY & MOLECULAR BIOLOGY; CHEMISTRY, ORGANIC; POLYMER SCIENCE

**Abstract:** Rapid cross-linking of elastin-like polypeptides (ELPs) with hydroxymethylphosphines (HMPs) in aqueous solution is attractive for minimally invasive in vivo implantation of biomaterials and tissue engineering scaffolds. In order to examine the independent effect of the location and number of reactive sites on the chemical cross-linking kinetics of ELPs and the mechanical properties of the resulting hydrogels, we have designed ELP block copolymers comprised of cross-linkable, hydrophobic ELP blocks with periodic Lys residues (A block) and aliphatic, hydrophilic ELP blocks with no cross-linking sites (B block); three different block architectures, A, ABA, and BABA were synthesized in this study. All ELP block copolymers were rapidly cross-linked with HMPs within several minutes under physiological conditions. The inclusion of the un-cross-linked hydrophilic block, its length relative to the cross-linkable hydrophobic block, and the block copolymer architecture all had a significant effect on swelling ratios of the cross-linked hydrogels, their microstructure, and mechanical properties. Fibroblasts embedded in the ELP hydrogels survived the cross-linking process and remained viable for at least 3 days in vitro when the gels were formed from an equimolar ratio of HMPs and Lys residues of ELPs. DNA quantification of the embedded cells indicated that the cell viability within triblock ELP hydrogels was statistically greater than that in the monoblock gels at day 3. These results suggest that the mechanical properties of ELP hydrogels and the microenvironment that they present to cells can be tuned by the design of the block copolymer architecture.

**Identifiers-- KeyWord Plus(R):** PROTEIN-BASED POLYMERS; EXTRACELLULAR-MATRIX PROTEINS; RECOMBINANT PROTEIN; MECHANICAL-PROPERTIES; PHYSICAL-PROPERTIES; ESCHERICHIA-COLI; DRUG-DELIVERY; CELL-ADHESION; HYDROGELS; BIOMATERIALS

**Cited References:**

BELLINGHAM CM, 2003, V70, P445, BIOPOLYMERS

BERNING DE, 1999, V121, P1658, J AM CHEM SOC

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Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

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The overall goal in material science is to be able to control the molecular architecture of a material and thus its end properties. There is no method that offers greater control than the biological synthesis of proteins. From the DNA sequence to the final synthesized protein, the entire process is finitely controlled. This present work describes methods developed and used to synthesize protein polymers by manipulating this process. From the initial DNA sequence chosen, the end properties that the protein polymer will have are dictated. An amphiphilic diblock copolymer was designed based on environmentally responsive elastin-mimetic peptide sequences [(Val/Ile)-Pro-Gly-Xaa-Gly] (Xaa = Ala or Glu for the hydrophilic block, Val or Phe for the hydrophobic block) and synthesized using a genetic engineering approach. Differential scanning calorimetry measurements in aqueous solution revealed that reversible hydrophobic folding and assembly of the copolymer occurs above the inverse temperature transition,  $T_{\text{IT}}$ , of the hydrophobic block. This process results in the formation of 50 nm protein-based micellar aggregates, which were characterized by electron microscopy and temperature-dependent dynamic light scattering techniques. The distribution of micellar aggregates can be altered reproducibly through variation of environmental conditions including pH and temperature. The uniform and defined macromolecular architecture of this protein copolymer permits greater control over the physical properties of the micelles, which therefore may facilitate applications in controlled release of small molecules.

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In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

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Rapid cross-linking of elastin-like polypeptides (ELPs) with hydroxymethylphosphines (HMPs) in aqueous solution is attractive for minimally invasive in vivo implantation of biomaterials and tissue engineering scaffolds. In order to examine the independent effect of the location and number of reactive sites on the chemical cross-linking kinetics of ELPs and the mechanical properties of the resulting hydrogels, we have designed ELP block copolymers comprised of cross-linkable, hydrophobic ELP blocks with periodic Lys residues (A block) and aliphatic, hydrophilic ELP blocks with no cross-linking sites (B block); three different block architectures, A, ABA, and BABA were synthesized in this study. All ELP block copolymers were rapidly cross-linked with HMPs within several minutes under physiological conditions. The inclusion of the un-cross-linked hydrophilic block, its length relative to the cross-linkable hydrophobic block, and the block copolymer architecture all had a significant effect on swelling ratios of the cross-linked hydrogels, their microstructure, and mechanical properties. Fibroblasts embedded in the ELP hydrogels survived the cross-linking process and remained viable for at least 3 days in vitro when the gels were formed from an equimolar ratio of HMPs and Lys residues of ELPs. DNA quantification of the embedded cells indicated that the cell viability within triblock ELP hydrogels was statistically greater than that in the monoblock gels at day 3. These results suggest that the mechanical properties of ELP hydrogels and the microenvironment that they present to cells can be tuned by the design of the block copolymer architecture. (c) 2008 American Chemical Society.

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